

US EPA RECORDS CENTER REGION 5



471555

**Remedial Design/Remedial Action (RD/RA)  
Oversight Work Plan  
Albion-Sheridan Township Landfill  
Albion, Michigan**

*Prepared for:*

U.S. Environmental Protection Agency  
Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

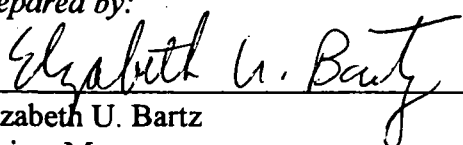
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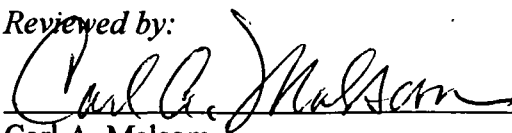
March 1996

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*Prepared by:*

  
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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The Albion-Sheridan Township Landfill Superfund Site is located approximately one mile east of Albion, Michigan, between East Erie Road and State Road 99. The landfill is in Calhoun County, but is bordered on the east by the Jackson County line. The landfill is inactive and consists of approximately 18 acres. A combination of residential, agricultural, commercial, and industrial properties surround the site. A private residence is located immediately adjacent to the landfill to the south and additional residences are located southwest of the landfill along East Erie Road. An active railroad track borders East Erie Road south of the landfill. The North Branch of the Kalamazoo River lies beyond the railroad tracks.

Approximately 10 private water supply wells are located within 2,000 feet of the site, including two wells which serve the Amberton Village subdivision. Where well depths are known, residents near the site obtain groundwater from the Marshall Formation at depths between 70 and 350 feet.

From 1966 to 1981, the landfill was privately owned and operated. The landfill accepted municipal refuse and industrial wastes from households and industries in the City of Albion and nearby townships. In the early 1970's, the Michigan Department of Environmental Quality (MDEQ), formerly the Michigan Department of Natural Resources (MDNR) approved the landfill to accept metal plating sludges. Other materials, such as paint wastes and thinners, oil and grease, and dust, sand, and dirt containing fly ash and casting sand, were also disposed of at the site. The landfill ceased operation in 1981.

A Record of Decision (ROD) was issued by U.S. EPA on March 28, 1995. The major components of the selected remedy include: removal and off-site treatment and disposal of hazardous and liquid waste drums; consolidation of landfill wastes away from a private residence; construction of a landfill cover in compliance with RCRA Subtitle D; active collection and treatment of landfill gases, unless passive venting meets applicable ARARs; monitoring of groundwater to ensure effectiveness of cap in lowering arsenic concentration; comprehensive monitoring program to ensure the effectiveness of the remedy; institutional controls to limit land and groundwater use; and provisions for a contingent remedy for groundwater treatment by *in-situ* oxidation if natural oxidation is not effective.

U.S. EPA issued a unilateral Administrative Order to four Respondents on October 11, 1995, which became effective on December 11, 1995. Three of the Respondents are complying with the Order. An RD Work Plan is expected near the end of March, 1996. The Agency anticipates

construction during 1997, but there is a possibility that PRPs will request a fast-track schedule so that construction could begin in late 1996. More likely, the only field activities to occur during 1996 would be pre-construction work such as monitoring well installation. This Scope of Work is written in anticipation of a RD phase lasting through April 1997. If the schedule changes significantly, this SOW may be revised.

## **1.2 SCOPE OF WORK**

The scope of work (SOW) for Remedial Design/Remedial Action (RD/RA) oversight was established by the U.S. EPA and documented in their February 7, 1996 SOW. The SOW includes technical review of all plans and specifications, limited oversight of field activities and participation in technical meetings conducted for the RD/RA. Split sampling is not included in the SOW.

The tasks outlined in the SOW includes the following:

Task 1: - Project Planning

Task 2: - Project Management

Task 3: - Review of Technical Plans and Reports

Task 4: - Technical Meetings

Task 5: - Field Oversight During Remedial Design

Task 6: - Field Oversight During Remedial Action

Task 7: - Community Relations Technical Support

## **2.0 RD/RA OVERSIGHT**

### **2.1 DESCRIPTION OF SPECIFIC TASKS**

The following tasks will be performed by EARTH TECH:

#### **2.1.1 TASK 1 - PROJECT PLANNING**

EARTH TECH has prepared this Work Plan for the performance of the RD/RA Oversight activities described in the U.S. EPA SOW. EARTH TECH has delineated tasks with associated hours and costs in the Work Plan. In addition, the Work Plan documents the responsibility and

authority of key personnel and organizations involved with the project. EARTH TECH personnel involved in the preparation of this Work Plan have technical expertise and working experience in environmental service areas including hydrogeology, environmental site investigation, groundwater modeling, groundwater monitoring, data evaluation, risk assessment, remedial system design, remedial response actions, waste disposal and management.

EARTH TECH's project team has been organized to facilitate efficient communication and scheduling and provide consistency in the completion of reviews and other tasks. The project organization is shown in Section 3.0. For each review assignment, personnel will be selected from the appropriate technical disciplines of the project team. Staff qualifications and experience are included in Appendix A. The budget has been provided under separate cover.

EARTH TECH will review project documents to become familiar with the background information necessary to assist in RD/RA oversight initially consisting of the following:

- the final RI/FS and Risk Assessment prepared for the site;
- the site ROD;
- The unilateral Administrative Order for RD/RA and SOW; and
- The potentially responsible parties (PRP's) Health and Safety Plan (HSP).

After reviewing the PRP's HSP, EARTH TECH will prepare an addendum to the HSP addressing our concerns or other modifications necessary to allow our utilization of the HSP.

EARTH TECH assumes that we will be provided with copies of the items listed above at least 30 days before the start of project activities to allow us adequate time to review the documents and prepare the addendum to the HSP.

#### **2.1.2 TASK 2 - PROJECT MANAGEMENT**

EARTH TECH will provide project management during Tasks 1, 3, 4, 5, 6, and 7. The EARTH TECH Project Manager will be responsible for technical quality, schedule, and budget. The project management responsibilities shall include, but not be limited to:

- day-to-day management;
- staffing and coordination of personnel;

- monthly technical, financial, and schedule status reports;
- compliance with contract administration requirements;
- task management and quality control; and
- coordination with the U.S. EPA.

EARTH TECH's primary purpose is to monitor the RD/RA activities and notify the U.S. EPA of deviations from the prepared plans or administrative orders. Specifically, the project team will notify the RPM Leah Evison, immediately to describe deviation from the ROD, inconsistencies between the design and on-site construction, failure to meet the requirements delineated in the Unilateral Administrative Order, or questions involving compliance with applicable or relevant and appropriate requirements (ARARs).

### **2.1.3 Task 3 - REVIEW OF TECHNICAL PLANS AND REPORTS**

EARTH TECH will provide technical review of the RD plans and technical reports prepared by the PRPs or their contractors for adequacy and thoroughness as well as compliance with the ROD, UAO, SOW, and any plans or reports approved to date. Reviews will focus on technical merit and not on spelling and grammatical errors. EARTH TECH will provide the U.S. EPA with a written report which documents the results of their review. Formal reviews by EARTH TECH will be provided for the following draft and revised documents: :

- RD Work Plan;
- Pre-design Studies Report;
- Preliminary (30%) Design; and
- Final Design

The draft and final reviews completed on the final design will be completed on the PRP's 90% Design (draft review) and Final Design (final review). Minimal time has also been budgeted for miscellaneous deliverables.

Unless directed otherwise by the U.S. EPA's RPM, EARTH TECH's review of revised (final) documents and plans will focus evaluating the adequacy of the responses to comments on the previous draft. If comments are not being incorporated into the revisions or satisfactorily addressed, EARTH TECH will bring this to the attention of the RPM. All comments will be provided to the RPM in hard copy and electronic format (disk or E-Mail) compatible with WordPerfect 5.1.

Document reviews will be completed within 21 days from the receipt of the document and notice from the RPM to review a particular submittal.

#### **2.1.4 TASK 4 - TECHNICAL MEETING**

At the request of the RPM, EARTH TECH will provide technical support and participate in meetings or teleconference calls with the PRPs relating to investigations, design documents, and implementation of the design, EARTH TECH personnel involved in the meetings or conference calls will be experienced with the issues under discussion and preferably be the personnel performing the document reviews.

For budgeting purposes, it was assumed that two EARTH TECH staff members will attend two meetings. All meetings were assumed to be held at the U.S. EPA office in Chicago, Illinois.

Each meeting is assumed to involve one 10-hour day including travel. In addition, six hours per meeting have been budgeted for preparation and phone conference calls with the RPM prior to the meeting. This additional time has been incorporated into the project management task per our instructions during the kickoff conference call.

#### **2.1.5 TASK 5 - FIELD OVERSIGHT FOR REMEDIAL DESIGN**

EARTH TECH will provide field oversight during "key periods of pre-design field work" as requested by the RPM.

This task has been budgeted based on the schedule included in the RD/RA SOW which states that EARTH TECH will provide a person for two days during each week of site activities. The field work associated with this project is anticipated to take place over a two week time period.

On-site personnel will provide oversight of PRP-conducted field activities to verify and document that these activities are completed in compliance with the U.S. EPA approved plans. During monitoring well installation activities by the PRP's contractor, EARTH TECH will, at a minimum, observe and document the following:

- Noting what type of information is being retained by the PRP's contractor in the compilation of drilling logs;
- Noting whether well installation locations utilized by the PRP are keeping with those detailed by the PRP's Response Design Plan.

- Noting whether non-dedicated drilling equipment is cleaned in an appropriate fashion between installation locations; and
- Noting that spent soil cuttings, decontamination fluids, and purge well development waters are handled in an appropriate fashion as stated in the PRP's Response Design Plan.

EARTH TECH will maintain a daily log during field activities which will be compiled and submitted to U.S. EPA within 10 days of the completion of the field activity. Any significant variation from the approved plans and procedures or the PRP's implementation of any given task will be reported to the RPM immediately by EARTH TECH. EARTH TECH will include in its activity submittals, a succinct visual record of the activities using slides.

During field activities, EARTH TECH field personnel will conform to the level of personnel protection outlined in the addended Health and Safety Plan.

#### **2.1.6 TASK 6 - FIELD OVERSIGHT DURING THE REMEDIAL ACTION**

EARTH TECH's responsibilities and level of effort will be determined upon receipt of the revised SOW addressing the RA. EARTH TECH has budgeted no time to perform RA oversight.

#### **2.1.7 TASK 7 - COMMUNITY RELATIONS TECHNICAL SUPPORT**

EARTH TECH will be available to participate in community meetings or other public relations activities. EARTH TECH has budgeted 18 LOE for this task and assumed that EARTH TECH will provide an individual to attend two meetings, including round-trip travel without overnight accommodations.

### **2.2 REPORTING/DELIVERABLES REQUIRED**

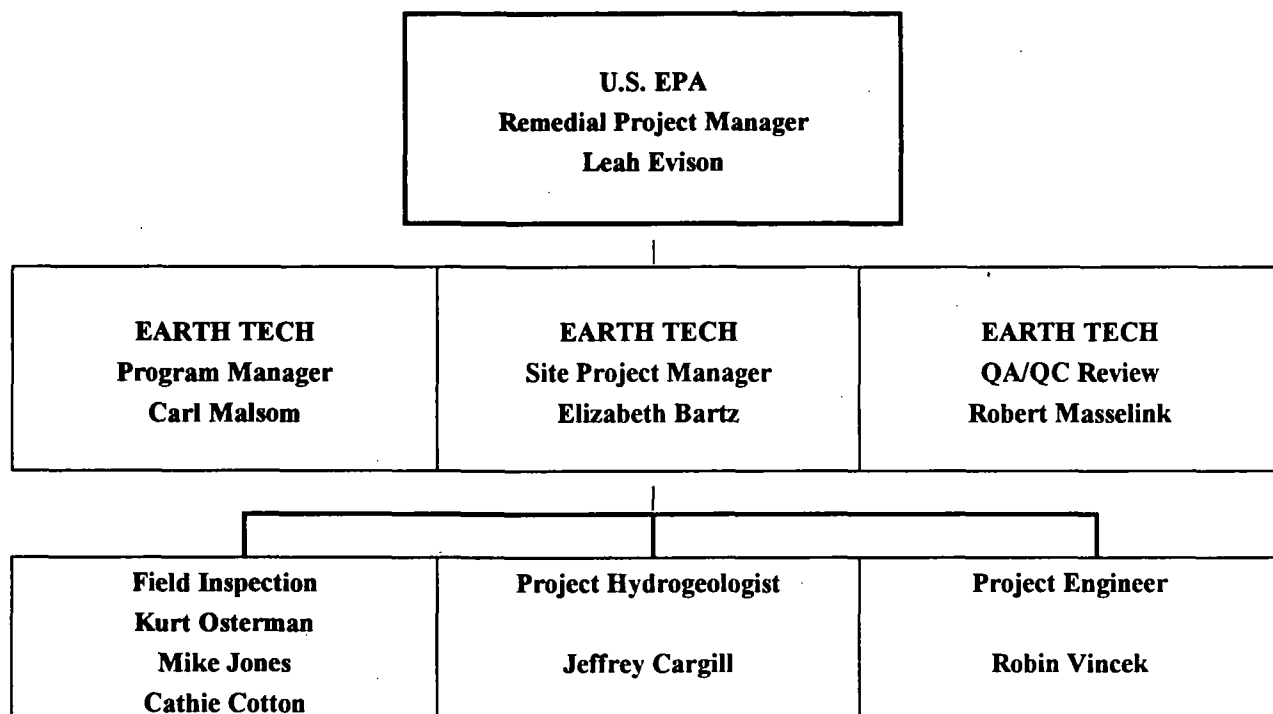
EARTH TECH shall provide review comments of PRP documents, field oversight reports, and other documents and plans described in the work plan in accordance with the schedule below:

<u>Submittal</u>	<u>Due Date</u>
RD Oversight Work Plan	Within 30 days after acceptance of the work assignment.
Health and Safety Plan Addendum	Within 30 days after receipt of PRP's Health and Safety Plan.

Comments on PRP RD Work Plan	Within 21 days after receipt of the PRP's RD Work Plan or as agreed to by U.S. EPA.
Comments on PRP Design Documents	Within 21 days after receipt of the PRP's Design Document or as agreed to by U.S. EPA.
Comments on Miscellaneous Deliverables	Twenty-one days after receipt of the deliverable or as agreed to by U.S. EPA.
Field Reports	Within 10 days after each trip for field oversight or as agreed to by U.S. EPA.
Monthly Progress Reports	Twentieth calendar day of the Month.
Project Closeout Report	Forty-five days after work assignment is terminated.

The schedule may be altered by the RPM depending upon specific needs or circumstances.

### **3.0 PROJECT TEAM ORGANIZATION**



#### **4.0 SCHEDULE AND BUDGET**

It is anticipated that the Implementation of the RD Activities will be completed by April 1997. These estimates for completion of activities are subject to the progress made by the PRP's. The accompanying Work Plan Budget summarizes the proposed hours and budget.

## *Appendix A*

### *Bios*

## **CARL A. MALSOM**

## **PROGRAM MANAGER FOR U.S.EPA ARCS**

### **EDUCATION**

B.S., Business Administration, Ferris State College, 1971

### **PROFESSIONAL SUMMARY**

Mr. Malsom is program manager for the Environmental Protection Agency's (U.S. EPA) ARCS contract, a corporate-wide, multimillion dollar, 10-year commitment to perform remedial investigation and engineering activities at hazardous waste sites in Region V (Ohio, Michigan, Indiana, Illinois, Wisconsin, and Minnesota). He manages and plans the day-to-day financial, administrative, and clerical functions associated with the ARCS contract to support and track project performance. He is directly responsible for all subcontract administration tasks, including bid document preparation, bid letting and bid review, subcontract award, subcontract progress payments, and subcontract change orders. Mr. Malsom, in conjunction with the administrative assistant, is responsible for the procurement, maintenance, and tracking of all government-owned equipment and supplies to perform the technical field work as well as the overall success of the multiple project assignments that are issued under the contract.

Mr. Malsom managed the preparation of wastewater project grant applications for municipal clients under the old Federal Water Pollution Control Administration program from 1971 until 1986. His experience with the U.S. EPA program covered the entire range of activities from facilities planning through design, construction, close-out, and project audit.

Mr. Malsom also prepared applications, completed grant and loan docket, and administered approximately 50 Farmers Home Administration water and sewer projects, community facilities and industrial parks throughout 1970's and early 1980's.

In more than 20 years as consultant, Mr. Malsom has consistently provided exceptional organization, management, and coordination for large multi-client and/or multi-project programs.

### **PROFESSIONAL EXPERIENCE**

- **ARCS Contract Program Manager.** Mr. Malsom is responsible for directing a long-term Federal contract for remedial planning, design and construction activities under the "Superfund Program." This contract consists of 2 functional parts—program management and remedial planning. Program management is provided on a completion basis for the term of the contract and encompasses management, financial, administrative and clerical functions necessary to support and track contract project performance. Site-specific remedial activities are provided on a *level of effort* basis, with all work being assigned through U.S. EPA issuance of work assignments. Mr. Malsom is responsible for directing the overall program through the ARCS program management office. He has direct control and oversees all personnel and technical staff performance, work task assignments, scheduling and budget preparation, cost control tracking and communication.
- **U.S. EPA's Wastewater Treatment Construction Grant Program.** As the director of the program to provide grant application and administration assistance for municipal clients, Mr. Malsom assisted in obtaining and administering approximately 160 individual U.S. EPA grants for wastewater treatment facilities planning, design, and construction. A majority of the clients were small municipal units with minimal administrative staff and no prior federal funding experience. Mr. Malsom provided detailed assistance with application preparation, grant administration, and grant close-out including audit review. He served as the municipal client's contact for the Federal agency and worked directly with the municipal administrative staff and elected officials.

- **Various Federal Funding Assistance for Municipal Clients.** Mr. Malsom has provided assistance to municipal clients in securing state and federal grant and loan funding for numerous programs including community development block grants, small cities block grants, and urban development action grants through the U.S. Department of Housing and Urban Development; outdoor recreation development grants through the Heritage Conservation and Recreation Service; economic development grants; and public works impact grants through the U.S. Economic Development Administration.
- **Construction Contract Administration.** Mr. Malsom provided the day-to-day construction contract administration for numerous civil construction projects including review of bid proposals and preparation of bid tabulations, assembling construction contract documents for execution by owner and contractor, preparation of contract change orders and periodic contractor payments, assembling all necessary documents for the close-out of construction projects, and the maintenance of all files applicable to the construction phase. Mr. Malsom's overall role is to provide the administrative support for the project manager and resident engineer throughout the construction period.

**EDUCATION**

M.S., Geology, Southern Illinois University, 1992  
B.S., Geosciences, University of Arizona, 1982

**REGISTRATIONS/CERTIFICATIONS**

OSHA 40-Hour Hazardous Materials Site Safety Course and Yearly 8-Hour Refresher Courses

**PROFESSIONAL SUMMARY**

Ms. Bartz, Project Manager, has more than 10 years of experience as an environmental professional. She plays a significant role in EARTH TECH's project teams to serve industrial, Federal, and other clients. Her strong technical background and abilities to organize team members allow her to expedite project tasks, providing the client with time- and cost-efficient schedules.

For the past 7 years, Ms. Bartz has been designated as the EARTH TECH'S key scientist in National Priority Listed (NPL) CERCLA sites in U.S. EPA Region 5. She has served in diverse and expansive roles on these projects, as project manager, site hydrogeologist, senior project hydrogeologist, and quality assurance/quality control coordinator.

Her responsibilities on CERCLA sites have provided her with a wealth of experience in preparing work plans, sampling plans, quality assurance project plans, data management plans, bid specifications, remedial investigation/feasibility study reports, implementation and oversight of remedial investigation field work, and participation in community relations. As a technical reviewer and advisor for various clients, Ms. Bartz has supervised field activities, reviewed documents, and participated in negotiations with potentially responsible parties.

Most recently, Ms. Bartz was selected to manage a CERCLA remedial investigation and feasibility study (RI/FS) for a municipal landfill—one of the first sites designated nationwide as a pilot project for the Superfund Accelerated Cleanup Model (SACM) program. This streamlined RI/FS process is designed to expedite the investigation and remedy-selection process for municipal landfill sites. Over the past 2 years, Ms. Bartz has provided coordination and continuity on the project despite several changes in client personnel. Her experience, communication skills and ability to focus team members have moved the project forward, adhering to the proposed schedule.

In addition to the CERCLA experiences, Ms. Bartz serves as lead hydrogeologist in numerous geologic and hydrogeologic investigations, Phase I and II environmental site investigations, and geophysical investigations. Her strong background in hydrogeology has provided experience in evaluating organic and inorganic ground water and soil contamination, monitoring well network design, characterization of contaminated sites, and environmental sampling of soil gas, ground water, soils, surface water and sediment.

**PROFESSIONAL EXPERIENCE**

- **Phase I and II Environmental Site Assessments for a Confidential Retail Client in Michigan and Indiana.** Ms. Bartz served as senior project hydrogeologist/project manager for several Phase I and Phase II environmental site assessments of properties slated for purchase and/or development by a major retail store chain. These included a hydrogeological assessment of ground water quality and extent of soil contamination studies. Ms. Bartz coordinated site activities and personnel, reviewed and edited reports, and provided support for legal and real estate decision-making. Ms.

Bartz mobilized personnel for the rapid implementation of the site assessments to meet rigorous schedules established by the client. As the client's advocate, Ms. Bartz often reviewed the seller's proposed remediation work plan and negotiated a more protective cleanup than originally proposed, thus benefiting the client's position.

- **Tri-County and Elgin Landfill, CERCLA RI/FS in Elgin, Illinois.** Ms. Bartz's initial role on this comprehensive RI/FS of two adjacent landfills was as the project geologist. She developed the project plans, prepared the subcontractor bid documents, scheduled and supervised field work, performed CLP laboratory scheduling and authored RI reports. During the course of the investigation, Ms. Bartz assumed leadership of the project. She led the project to completion with her progressive direction of geologists, toxicologists and engineers. Ms. Bartz assisted the client in successful negotiations of the remedial design scope of work.
- **Albion-Sheridan Township Landfill, CERCLA RI/FS, Albion, Michigan.** Ms. Bartz managed a multidisciplinary project team in rapidly implementing a SACM RI/FS of a municipal landfill. Ms. Bartz streamlined the investigation by collecting only enough analytical and physical data to support the presumptive remedy for typical municipal landfill sites--capping, venting of landfill gas and leachate collection. This resulted in a focused investigation, carried out in an expeditious and efficient manner. The entire project is projected be completed in 2 1/2 years.
- **Remedial Investigation and Feasibility Study for Kohler Landfill, CERCLA in Kohler, Wisconsin.** Ms. Bartz provided technical support for U.S. EPA of a PRP-led RI/FS investigation of an industrial landfill in eastern Wisconsin. She reviewed and prepared comments on the RI/FS project plans and the RI/FS reports on behalf of U.S. EPA to ensure the technical quality. Ms. Bartz coordinated with field personnel regarding suitability of field work, and sought solutions to contentious issues with the PRP's. She participated in numerous conference calls and meetings with the U.S. EPA, the PRP's and their consultants. Ms. Bartz also designed a soil vapor sampling program at the landfill which entailed outlining and budgeting the investigation, preparing a QAPP for Region 5 approval and bidding the installation of soil vapor probes. EARTH TECH performed the field work in two weeks and identified several new "hot spots" on the landfill, not originally revealed by the PRP's. At the client's request, Ms. Bartz also designed a ground water sampling program for the analysis of low detection PCBs. Ms. Bartz gained rapid approval for the QAPP and scheduled the laboratory and field work. Upon conclusion of the field investigation, Ms. Bartz prepared the ground water sampling technical memorandum.
- **Multi-Site Oversight, Federal Facilities, Michigan, Illinois, and Ohio.** Ms. Bartz served as quality assurance/quality control coordinator for a multi-site Federal facility oversight contract with the U.S. EPA. This particular contract includes a total of 19 Non- NPL Region 5 Department of Defense, NASA and Department of Commerce facilities. Ms. Bartz role is to support the U.S. EPA by providing technical reviews of SI work plans and reports, RI/FS work plan and reports, remedial action documents, decision documents, and ROD's. She has been a key member on this project to date and has prepared the work plan and budgets for this multi-faceted project. To enhance her contributions to this project, Ms. Bartz attended a Base Closure, Cleanup, and Reuse Conference in the fall of 1993.
- **Quality Assurance Project Plan (QAPP) Preparation, Region 5.** Ms. Bartz has authored many Region 5 CERCLA QAPP's for agency and industrial clients. Her diligence and perseverance has resulted in timely approvals with minor modifications. Ms. Bartz has prepared the following QAPP's:
  - Kohler Landfill Soil Vapor Sampling
  - Kohler Landfill Low Detection PCB GW Sampling
  - Cannelton Industries RI/FS
  - Fort Howard Oversight Ground Water Sampling

Skinner Landfill RI/FS  
Novaco Industries RA Ground Water Sampling  
Tri-County/Elgin Landfill RI/FS  
Albion-Sheridan Township Landfill RI/FS  
Confidential Client RD/RA

**PROFESSIONAL ORGANIZATIONS**

National Ground Water Association  
Geological Society of America

**EDUCATION**

M.S., Civil Engineering, Michigan State University, 1971

B.S., Civil Engineering, Michigan State University, 1970

**REGISTRATIONS/CERTIFICATIONS**

Registered Professional Engineer - Michigan, Indiana, Ohio

**PROFESSIONAL SUMMARY**

Mr. Masselink is responsible for the management of multidisciplinary projects. He also maintains technical expertise in the area of geotechnical and geoenvironmental engineering. In the last several years, Mr. Masselink has been involved with all aspects of geotechnical and hydrogeological engineering including solid/hazardous waste investigation projects, groundwater and soil contamination, development, and implementation of remedial action plans.

**PROFESSIONAL EXPERIENCE**

- **Evaluation of Landfill Gas Venting Alternatives, Portage, Michigan.** The City of Portage has a public park developed over a closed landfill. The park consist of six softball fields, a concession stand, and parking areas. A previous study indicated existence of subsurface gases from landfill decomposition. Project involved an evaluation of existing conditions and rerun of past reports. Four alternatives were developed for venting landfill gases with preliminary cost estimates and recommended course of action. Responsibilities included review of existing documents, site visit, discussion with city personnel and preparation and submittal of report.
- **Closure of Samulson-Ash Pit, Traverse City Light and Power, Traverse City, Michigan.** Preparation of plans and specifications for closure of existing ash disposal area. Plans and specifications were submitted and approved by Michigan Department of Natural Resources. Plans and specs were prepared to fulfill consent order requirements. Project also included supervision of construction administration personnel and certification of closure. Responsibilities included project management, administration, billings, client contact, budgeting, contract negotiation, supervision of technical staff, certification of closure, and interaction with attorneys and government agencies.
- **Home Depot Development, Southfield, Michigan.** (Performed geotechnical evaluation of 12-acre site for commercial development as a Home Depot Store. The site was formerly used as an area municipal landfill. Project included a preliminary report to assess feasibility of alternative development strategies, pilot study to evaluate surcharging, detailed geotechnical report, specifications, review of plans, and consultation during construction. The design included augercast piling for the building site, surcharge for parking and roadways, gas containment, and collection and discharge for the building and parking areas.
- **Slurry Wall, Escanaba, Michigan.** Geotechnical Engineer for design and construction quality control of slurry wall for containment of existing impacted groundwater at a fuel storage facility located on a bay in Lake Michigan. The fuel storage facility stored JP4 jet fuel for use by the U.S.

Air Force at K.I. Sawyer Air Force Base at Escanaba, Michigan. The slurry wall was designed for  $1.0 \times 10^{-7}$  cm/sec hydraulic conductivity. A cement/bentonite wall with crusher fines as an additive was installed to achieve the required permeability. Project responsibilities included preparation of plans and specifications, construction inspection, and sampling and testing of the installed slurry wall to verify design permeabilities.

- **Industrial Park Development, Three Rivers, Michigan.** Project Manager for initial studies to determine the feasibility of developing an industrial/commercial office park on 350 acres of agricultural land. Evaluation involved preliminary geotechnical assessment of subsurface soils, wetland determination, and environmental assessment.
- **Type II (Domestic Waste) Landfill, Kent County, Michigan, Department of Public Works.** Conducted laboratory grain size and permeability analyses for site clay soils used as liners in new solid waste disposal cells for landfill expansion.
- **Type II (Domestic Waste) Landfill Site.** Technical review of engineering design of a Type II landfill site under litigation. Hydrogeological setting, imported clay liner, zoning and impacts of the site's proximity to a major Michigan river and probable encroachment of the 100-year floodplain were the factors of greatest concern.
- **Type III (Demolition Waste) Landfill.** Responsible for preliminary and final design of a Type III landfill for the disposal of fly ash wastes. The landfill was designed according to requirements of Michigan Department of Natural Resources and the Solid Waste Management, Public Act 641.
- **Type I (Hazardous Waste) Landfill.** Project Manager responsible for laboratory and field programs using fluorescent tracer dye to evaluate the integrity of a clay liner system for the containment of metal plating wastes.
- **Type I (Hazardous Waste Landfill).** Project Manager responsible for laboratory testing to determine the compatibility of existing clay liner soils to hazardous waste leachate. The project involved the design of an apparatus to resist degradation by chemicals in the hazardous waste.
- **Type II (Domestic Waste) Landfill.** Brownstown, Michigan. Technical review of developer's proposal for construction and operation of a Type II landfill in Brownstown Township. Technical input was provided for development of a written agreement between the developer and the Township. The agreement was the result of numerous negotiating sessions between the developer and Township officials.
- **Type I (Hazardous Waste) Landfill.** Technical Manager responsible for literature review, laboratory testing, and report preparation to determine the mobility of five organic compounds through an existing clay liner system. One of the five compounds was subsequently used as a tracer to provide early detection of seepage through the lines.
- **Type I (Hazardous Waste) Landfill Closure.** Project Manager responsible for providing support, technical and analytical services during temporary closure operations of a licensed Act 64

hazardous waste landfill. The project involved detailed sampling and analytical testing of on-site soils to establish limits of removal. All sampling and testing were completed according to current regulatory standards. On-site inspection and survey services were provided to establish a detailed, written account of construction activities for possible future litigation.

- **Site Investigation, Wisconsin Public Service.** Project Manager for site investigation of five former coal gas manufacturing facilities located throughout Wisconsin. The investigation was a detailed sampling and analytical testing program for the air, surface and subsurface soils and the groundwater.
- **Remediation of Contaminated Soils.** Project Manager for remediation of toluene contaminated soils. The project involved technical research on the applicability of surfactants for flushing toluene from contaminated soils. EARTH TECH designed and contracted a long-term groundwater capture and discharge system.
- **Investigation and Remediation of Impacted Groundwater, Portland, Michigan.** Project Manager for investigation and implementation of remedial action for groundwater impact from past underground tank operations. The site was located adjacent to the existing municipal wellfield. Full site investigation and installation of a purge well and treatment system was completed within 60 days to provide maximum protection of existing municipal wellfield. A well management program was implemented to provide operational guidelines during cleanup activities. A soil vapor extraction system was designed and constructed to remove volatiles in the unsaturated zone.
- **Shoreline Design, Bridgman, Michigan.** Provided assistance and technical review for the design of a rubble groin to protect a beach house along Lake Michigan's shoreline. The groin is 35 feet long and made of three to four foot diameter armor stone. It is used in conjunction with other groins to trap drifting sand and reduce erosion.
- **Shoreline Evaluation, Wyandotte, Michigan.** Technical Manager for evaluation of shoreline stability for industrial site located on the Detroit River near Lake Erie. Sheet piling, rockwall, and sandy cove were evaluated for long-term erosion potential from wave forms and floodwaters.
- **Shoreline Evaluation, Petoskey, Michigan.** Geotechnical Engineer for evaluation of shoreline stability of Bayview Association on Traverse Bay.
- **Shoreline Stability Evaluation, U.S. Corps of Engineers.** Geotechnical Engineer for evaluation of rockslope stability for existing jetties at Ludington, AuGres, and Muskegon. Evaluation utilized slope stability methods approved by U.S. Army Corps of Engineers.
- **Wastewater Collection and Treatment System, Leoni and Blackman Townships, Jackson County, Michigan.** Resident Engineer for the administration of 19 construction contracts on a \$15 million wastewater collection and treatment project. The treatment facilities included aerated ponds followed by storage ponds and spray irrigation of the effluent. The project required numerous crossings of interstate highways and state trunk lines, and was coordinated with the Michigan Department of Transportation.

- **Asphalt Paving Projects.** Resident Engineer on major street projects in the following Michigan communities: Alma, Jackson, Portage and St. Johns.
- **Wastewater Treatment System Evaluation, Michigan Department of Management and Budget.** Study Manager responsible for the preparation of a wastewater system study and analysis of failed septic tank drainfield systems in four prison camp facilities located within the state.
- **Water System Analysis, Saranac, Michigan.** Project Engineer responsible for preparation of an analysis of the existing supply wells and water distribution system in the Village.
- **Infiltration/Inflow Analysis, Holland, Michigan.** Responsible for Infiltration/Inflow Analysis on 421,000 feet of sewer for a resort community on the shores of Lake Michigan. Most of the sewer system was over 75 years old. The analysis indicated a direct correlation between infiltration rates and the water level in Lake Michigan.
- **Infiltration/Inflow Study, Union City, Michigan.** Responsible for the preparation of Infiltration/Inflow Analysis of 12,700 lineal feet of sanitary sewer.

#### **PROFESSIONAL ORGANIZATIONS**

American Society of Civil Engineers  
Michigan Society of Professional Engineers  
National Society of Professional Engineers

#### **PUBLICATIONS**

Masselink, R.L., Ilgenfritz, E.M., Blanchard, Fred A., and Panigrahi, Bijay K., "Mobility and Effects in Liner Clay of Fluorobenzene Tracer and Leachate", published by Ground Water, Vol. 26, No. 1, Jan.-Feb. 1988.

**REGISTRATIONS/CERTIFICATIONS**

HAZWOPER Health and Safety Training Course (EPA 29 CFR 1910)  
40-Hour and Up-To-Date 8-Hour Refresher Course

**PROFESSIONAL SUMMARY**

Mr. Osterman is a field technician with more than 6 years of experience. His current responsibilities include supervision of contractors during soil sampling and monitor well installation, tank installation, removals, and impoundment closures; and field investigations involving sampling of soils, water and hazardous waste.

He has participated in four U.S. EPA ARCS programs consisting of remedial investigation and feasibility study of soil and ground water contamination. He has a thorough knowledge of procedures required by the U.S. EPA in well installations, soil, and surface sediments, ground and surface water sampling, and the documentation necessary to record, ship and track these samples.

Mr. Osterman is experienced with the operation of many types of drill rigs including the Acker 45, CME 45, CME 55, CME 750, and D-25. In project field activities, Mr. Osterman has supervised split-spoon sampling and the construction of monitoring wells. He is familiar with equipment decontamination procedures and has supervised cleaning of well casings and drill equipment in preparation for their use in potentially hazardous sites.

Mr. Osterman's experience and training also includes the use of several types of field testing equipment such as pH meters, conductivity meter, Eh meters, dissolved oxygen meters, PID and FID meters, flow meters, explosive meters, and the geophysical downhole gamma logger. He is also familiar with using the Hermit data logger for slug testing wells and putting all field information on a computer. He has participated in numerous projects requiring new and unique sample methods including slow flow and low flow volume discharge. He is experienced in field elevation measurement and mapping.

He is thoroughly familiar with the use of pumps to sample monitor wells, including small diameter submersible units, gas driven bladder pump, peristaltic pump, and centrifugal ditch pump and is familiar with the use and decontamination procedures for different bailers used for ground water sampling.

Mr. Osterman has completed the 40-hour OSHA safety training course and the 8-hour refresher courses on an annual basis. He is familiar with A, B, C and D levels of protection required in all field work.

**EDUCATION**

B.A., English, Michigan State University, 1974

Business Studies: Seidman Graduate College of Business  
and Grand Valley State University

**PROFESSIONAL SUMMARY**

Mr. Jones, Senior Field Technician, has more than 10 years of experience at EARTH TECH. He serves as construction inspector and site manager of field activities and oversees or performs geotechnical field investigations. Normally assigned to the Environmental Services Division, Mr. Jones is often responsible for projects that involve EARTH TECH's civil, mechanical, and operations divisions.

He is adept in the use of a variety of field testing equipment related to civil and environmental field procedures, including the Troxler nuclear densometer, Michigan sand cone, and speedy moisture test; he has performed maximum density tests, concrete testing, photoionization detector, flame ionization detector; various toxic gas monitors and water testing instruments such as pH, dissolved oxygen, turbidity and conductivity meters. He has performed percolation tests associated with drainage analyses. He was certified by Horner Creative Products\* in 1986 to perform, witness, and verify the integrity of underground storage tanks and piping.

Mr. Jones has completed the 40-hour OSHA safety training course and the additional 8-hour site supervisor's course. He is trained in the use of B, C and D levels of personal protection, and he has frequently worked at these levels. He often is the designated Site Safety Officer on large remediation and demolition projects, and served in this capacity in a closure of 25 underground storage tanks at a large manufacturing facility in West Michigan. He has also served as the Owner's Representative or Construction Manager during the construction of various industrial ground water treatment systems. He has coordinated and supervised drilling, mechanical, excavation, electrical, roofing and concrete contractors.

Mr. Jones participates in the U.S. EPA ARCS Program of remedial investigations and feasibility studies at numerous sites. He has also worked in projects directly involving the U.S. Army Corps of Engineers, Michigan National Guard, and the Michigan Department of Natural Resources. He has a thorough knowledge of procedures required by such agencies in well installation, soil and surface sediment sampling, ground and surface water sampling, the excavation and disposal of contaminated soil, and soil vapor testing. He is experienced in documenting and record keeping of all of these activities.

**PROFESSIONAL EXPERIENCE**

- **Demolition, Remediation and Restoration Project in Michigan.** Mr. Jones served as the Owner's Representative during the demolition of numerous commercial structures and storage tanks and the subsequent remediation and restoration of the site. Mr. Jones witnessed and verified the excavation and disposal of 1,400 cubic yards of soil contaminated with hydrocarbons and heavy metals, and performed the verification sampling. The subsequent site restoration involved backfilling excavations, sewer installations, construction of concrete retaining walls, hillside

\* The Horner system is registered with the State Fire Marshal's office, Michigan State Police.

reconstruction and stabilization efforts, and asphalt road and parking area construction. Mr. Jones inspected and documented all contractor activities related to these tasks. Extensive soil density testing (Troxler) and other documentation was required to support the geotechnical and environmental concerns of regulatory agencies.

- **Floodwater Dike Construction Certification in St. Joseph, Michigan.** Mr. Jones was the Owner's Representative during the construction at a 1,200-foot-long floodwater dike built adjacent to the St. Joseph River. The dike construction immediately followed soils removal activities related to contamination by heavy metals and chlorinated hydrocarbons. He directed all testing and data recording necessary for U.S. Army Corps of Engineers for geotechnical certification. Testing included Troxler nuclear density testing, soil moisture testing, and collection of samples for laboratory testing.
- **Underground Storage Tank Removal and Soils Excavation for Confidential Client in Michigan.** Mr. Jones directed field activities in the closure and removal of underground storage tanks, excavation and disposal of soils, and required testing at a large power facility in Grand Rapids, Michigan.
- **Underground Storage Tank Removal for CSX Transportation in Western Pennsylvania.** Mr. Jones directed all field activities during closure activities of underground storage tanks and oversaw subsequent hydrogeological investigations for a rail transportation corporation at 12 of their facilities located throughout Western Pennsylvania.
- **Purge Well Redevelopment Project at Sundstrand Corporation in Michigan.** Mr. Jones oversaw contract employees during this purge well redevelopment project. He coordinated the on-site containment, transport, monitoring, treatment, documentation and disposal of 150,000 gallons of purge water. He also set up and maintained the operation of the portable carbon water treatment system during the winter months.
- **Monitoring Program at Wurtsmith Air Force Base in Oscoda, Michigan.** Mr. Jones served as senior field technician throughout large-scale monitor well sampling contract. He supplied oversight, documentation and sampling during subsequent drilling activities related to a hydrogeological investigation.
- **Hazardous Waste Storage Area Closure at Pharmaceutical Company in Michigan.** Mr. Jones performed the oversight and documentation of closure activities at a hazardous waste (RCRA) storage area at a large pharmaceutical company. He supervised and coordinated subsequent vapor well installations and related hydrogeological investigations.
- **Installation of Monitor Well and Purge Well System at Rexair in Cadillac, Michigan.** Mr. Jones performed the oversight and documentation during the installation of monitor and purge wells as part of a complex remediation system. He provided all documentation and inspection services related to mechanical, excavation, sheet metal, concrete and on-site tower fabrication contractors. This project was the largest capacity system of its type in Michigan.

- **Closure of Underground Storage Tanks at General Motors in Flint, Michigan.** Mr. Jones performed the long-term oversight and documentation of closure activities at this large auto manufacturer.
- **Process Water Study at Paper Manufacturing Facility, Parchment, Michigan.** Performed and coordinated an emergency H<sub>2</sub>O study that ran 24 hours a day for four weeks. The study involved 4 waste streams, from different paper machines that each made specialty paper products. As a result of this project, additional work was awarded to EARTH TECH and is currently in progress.
- **Air Sparge Treatment System, Confidential Client, Michigan.** Managed the installation of electrical controls, blowers, a building, and 3000 feet of piping used as an air sparge treatment system. The system was built through an active wetland/swamp. It was used to treat volatile contaminants that were accidentally discharged.
- **U.S. EPA On-site Representative.** ARCs oversight during 18-month remedial action at closed landfill. Construction activities involved clay capping, leachate recovery system, vent installations, and construction of a water treatment facility. U.S. EPA awarded EARTH TECH an outstanding rating for documentation and liaison activities.
- **Period of Indefinite Shutdown at Stamping and Plating Facility for Confidential Client in Michigan.** Project addressed the environmental, legal, and physical plant issues that enabled a large industrial client to indefinitely cease operations. Inventoried the facility, then helped develop plans and specifications that focused on stabilizing the facility's physical plant. Worked with client's personnel, reviewing progress, documenting and advising on progress. Progress was documented using photographs and progress reports.

**REGISTRATIONS/CERTIFICATIONS**

40-hour HAZWOPER Safety Training Course  
8-hour Refresher Courses

**PROFESSIONAL SUMMARY**

Ms. Cotton is a senior field technician with more than 10 years of experience in surveying, environmental sampling and investigation. Her current responsibilities include the full range of environmental field duties including supervising field crews during the installation of geotechnical environmental soil borings and monitor wells; tank removals; and impoundment closures. She has a thorough knowledge of standard procedures for sampling and documentation--project managers and clients alike have expressed their confidence in her ability. She consistently demonstrates her abilities based on experience, a practical approach and good decision-making skills while in the field.

She has participated in 4 U.S. EPA ARCS projects consisting of remedial investigation and feasibility study of soil and ground water contamination. Ms. Cotton has a thorough knowledge of procedures required by the U.S. EPA in well installation, sampling of soils and water, and documentation required to meet ARCS standards; she was lead field technician for a comprehensive Phase II investigation for Cannelton Tanneries in Sault St. Marie and for Albion-Sheridan Landfill in Albion, both in Michigan.

Ms. Cotton has experience in using a wide variety of field methods and equipment. In project field activities, she has supervised split-spoon sampling and the construction of monitoring wells, using a variety of methods such as hollow-stem and solid-stem augering, clear-water and bentonite mud rotary, air rotary, drive casing, spin casing, double casing, and bedrock coring and sampling. She is knowledgeable in the use of several makes and styles of drill rigs including Acker, CME, Diedrichs and Guspechs, and bucket auger drilling equipment. More recently, Ms. Cotton has had the opportunity to both supervise and operate the Geoprobe sampling equipment, proven as an efficient and cost-saving method for such work as UST investigations, ground water plume investigations, and Phase I and II research.

Ms. Cotton's experience and training also includes the use of several types of field testing equipment: pH and EH meters, conductivity meters, dissolved oxygen meters, PID and FID meters, flow meters, and the geophysical downhole gamma logger. She has participated in regulatory monitoring programs for companies such as Dow Chemical, Mead Paper, Cogentrix, and Rexair, Inc., where knowledge of proper sampling techniques and ability to use and interpret field equipment is critical.

She is thoroughly familiar with the use of pumps to sample monitoring wells, including small diameter submersible units; gas-driven bladder pump; peristaltic pump; and centrifugal ditch pump and she is familiar with the use and decontamination procedures for different bailers used for ground water sampling. She has participated in numerous projects such as the ground water investigation for MichCon requiring unique sampling methods such as slow-flow and low-volume discharge.

Ms. Cotton has also taken a comprehensive course in land surveying, earning a Surveyor Technician I certificate. She is experienced in field elevation measurement and mapping, as well as staking property surveys. She participated in the remonumentation program of Kent County during 1981 and 1982.

Ms. Cotton has completed the 40-hour HAZWOPER safety training course and has attended 8-hour refresher courses every year, in accordance with 29CFR1910.120.

**PROFESSIONAL EXPERIENCE**

- **Hydrogeologic and Remedial Investigation for Marathon Oil in Michigan.** Ms. Cotton served as field technician in this project for an oil refinery and distributor in Muskegon, Michigan. She used Geoprobe--a time and cost saving investigative technique--in this investigation.
- **Underground Storage Tank Removal for Four Star Service Stations in Michigan.** In this tank removal program, Ms. Cotton used the Geoprobe as part of the field investigations.
- **Soil and Ground Water Investigation at American Thread, Inc. in Connecticut.** Ms. Cotton served as lead field technician in this soil and ground water investigation for the closure and refurbishing of one of the oldest cotton thread mills in the U.S.
- **Ground Water Investigation for Coal Tar Contamination at MichCon in Michigan.** Ms. Cotton was field technician in this ground water investigation for coal tar contamination.
- **Monitoring Program for Mackinaw Island Landfill in Michigan.** Ms. Cotton was an active participant in the field team who completed monitoring of ground water for closure of landfill and transferring to recycling center.
- **Soil Vapor Study for General Motors in Michigan.** Ms. Cotton served as lead field technician on this soil vapor project for GM.

**EDUCATION**

M.S., Geology, Kent State University, 1989

B.S., Geology, University of Michigan, 1985

A.S., Geology, Grand Rapids Community College, 1983

**PROFESSIONAL SUMMARY**

As a project geologist, Mr. Cargill provides technical expertise in environmental, geotechnical and hydrogeological investigations. His 6 years at EARTH TECH have seen a fast-paced growth of experience and responsibility. He prepares proposals and budgets; coordinates and supervises field work; evaluates and interprets data; and documents his findings in reports. He works closely with laboratory, field and other staff to accomplish the goals of each project. His academic background and his technical resourcefulness result in high performance on each project.

Mr. Cargill's knowledge of geology, engineering, and environmental regulations has been valuable in performing combined environmental and geotechnical site assessments. He is adept in working on hydrogeological investigations for large industrialized sites, CERCLA and RCRA sites, as well as investigations of localized contaminant releases. He has demonstrated his abilities in designing drilling and sampling programs and ground water monitoring programs.

Other previous experience includes: conducting soil gas surveys for environmental assessments and petroleum exploration; supervising rock core drilling for a large tunnel project; and inspecting the installation of caissons and footings.

**PROFESSIONAL EXPERIENCE**

- **Hydrogeological Investigations at Tri-County and Elgin Landfills in Illinois.** Mr. Cargill worked as a project team member to investigate complex contamination problems at two adjacent landfills. These landfills have been designated as a priority cleanup sites by the U.S. EPA. Mr. Cargill coordinated field work, evaluated geological and hydrogeological information, and documented all activities in a remedial investigation/feasibility study report.
- **Site Assessments for a Major Retail Chain in Michigan and Indiana.** Mr. Cargill was a key staff member in conducting environmental and geotechnical site assessments at several different sites throughout Michigan and Indiana for this retail chain. He coordinated field work and analytical testing of samples, evaluated the data, and prepared environmental and geotechnical reports.
- **Site Assessments for Various Restaurant Chains in Michigan.** Mr. Cargill performed environmental and geotechnical site assessments at several properties. He coordinated field work and analytical testing of samples, evaluated the data, and prepared environmental and geotechnical reports.
- **Remedial Investigation for an Automotive Manufacturer in Michigan.** Mr. Cargill was part of a project team that investigated 11 sites on which concrete potentially contaminated with chromium and/or PCBs had been deposited. Because the material could be considered hazardous waste, it was critical that it be identified and disposed of properly. Mr. Cargill

performed preliminary site inspections and prepared remedial investigation/feasibility study work plans for these sites.

- **Hydrogeologic Investigation for a National Paper Manufacturer in Michigan.** A hydrogeological investigation was part of a comprehensive environmental program for this client. The hydrogeologic investigation covered a 2,000-acre area and included installation and sampling of over 100 ground water monitoring wells, 3 aquifer pumping tests, and preparation of a comprehensive ground water computer model to simulate the effects of proposed remedial actions. Mr. Cargill coordinated field work and sample analyses, evaluated and interpreted geological and hydrogeological information that was collected, and documented the results in a report. The investigation included delineating the horizontal and vertical extent of soil and ground water contamination associated with an unlined landfill, a recently constructed landfill, and a 120-acre lagoon system.
- **Environmental Investigation at a Former Coal Tar Manufacturing Facility in Wisconsin.** Mr. Cargill was part of the project team that performed an environmental investigation to delineate the extent of coal tar impacted soils, ground water, and sediment. The investigation involved drilling and sampling on site and in a river adjacent to the site. Mr. Cargill coordinated field work and sample analyses, evaluated geological and hydrogeological data, and incorporated all information into a report for submittal to the regulatory agency.
- **Hydrogeological Investigation at a Chemical Manufacturing Facility in Michigan.** This was an investigative project to evaluate the shallow ground water flow patterns at a 500-acre site. As part of the project team, Mr. Cargill assessed the feasibility of managing shallow ground water on a site-wide basis. The results indicated that the main production area of the site could be subdivided into several separate hydrologic zones defined by sewer trenches in clay that were backfilled with granular soil. The investigation demonstrated that an efficient monitoring program could be designed using the existing sewer system network, rather than unit specific monitoring. This resulted in a significant cost savings for the client.
- **Environmental Investigation for a Gasoline/Convenience Store in Michigan.** Mr. Cargill performed environmental investigations at several sites to delineate the extent of soil and/or ground water contamination. Mr. Cargill coordinated field work and analytical testing of samples, evaluated the data, and prepared environmental and geotechnical reports. The reports included recommendations for monitoring or remedial action as appropriate for each site.
- **Underground Storage Tank Closure for a Chemical Manufacturing Facility in Michigan.** Mr. Cargill coordinated an investigation for characterization and subsequent closure of a leaking underground storage tank. The results of the investigation indicated that the site could be remediated using an existing remediation system that had been previously installed for an unrelated release. Subsequent verification samples indicated that the corrective action was successful. Use of the existing remediation system enabled the site to be remediated and receive clean closure with no additional cost to the client for cleanup.
- **Leaking Underground Storage Tank Services for a Petroleum Company in Michigan and Indiana.** Mr. Cargill was an active participant in hydrogeologic investigations to ascertain the extent of petroleum in both soil and ground water. These investigations were the bases for

determining the most appropriate and cost-effective remedial solutions for the sites. Since the project began, 2 sites have been closed, 6 sites are in the process of implementing corrective actions, and 3 of the sites are currently being investigated.

**PROFESSIONAL ORGANIZATIONS**

National Water Well Association

Association of Engineering Geologists

**PUBLICATIONS**

Evaluation of Empirical Methods of Measuring the Uniaxial Compressive Strength of Rock. Int. J. Rock Mech. Min. Sci. & Geomech. Abstr., Vol. 27, No. 6, pp. 495-503 (1990).

**EDUCATION**

B.S., Civil Engineering, Michigan Technological University, 1984

**PROFESSIONAL SUMMARY**

Mr. Vincek is responsible for the design and management of plans and specifications for various civil and environmental engineering projects for our firm. With ten years of engineering experience, Mr. Vincek has been involved with many diverse engineering projects.

Prior to his employment with our firm, Mr. Vincek worked several years as project engineer for a consulting firm in North Carolina. His responsibilities included technical coordination, design and management of commercial, industrial and residential subdivisions. Mr. Vincek has been involved in project management of roadways, streets, water mains, sanitary sewer systems, earthen dams, stormwater detention, grading and erosion control plans, environmental site assessments, and soil and groundwater remediation activities.

**PROFESSIONAL EXPERIENCE**

- **Carbon Systems.** Project Manager for design and construction, along with operation and maintenance, of a twin 800 lb. carbon system and a twin 1,500 lb. carbon system for the capture and treatment of impacted groundwater. These systems have been very successful in the capture and treatment of the BTEX and PNA impacted groundwater. Included in the soil remediation of a municipal site was the Type C Closure of slightly impacted soils saving at least \$250,000 in removal and disposal costs.
- **Wetland Mitigation Design.** Sullivan County, Indiana. Project Manager responsible for assembling a permit application for the design of hydraulic structures to maintain wetlands for the installation of a haul road for an Amex Coal Company strip mining operation. Supporting calculation for the installation of sediment basin and control structures for six wetland areas. Documentation included calculations for primary spillway (10 year, 24 hour storm) and emergency spillway (25 year, 24 hour storm) for each structure. Design included channel stabilization by vegetation or riprap as required. Wetland mitigation was negotiated with the U.S. Fish and Wildlife Service.
- **Sedimentation Basin Design.** Sycamore Mine, Indiana. Project Manager responsible for the design of sedimentation basin control structures for an Amex Coal Company strip mine in a remote area. All materials had to be maneuvered by the use of an ATV due to the rough and remote location. Spillway and energy dissipators in the stormwater channels were provided by the use of treated timbers. Details for construction and stabilization for low-maintenance were approved by the Indiana Department of Environmental Management.
- **Solid Waste Facility Quality Assurance.** Greene County, Indiana. Project Manager responsible for the construction quality control/quality assurance procedures for the installation of a compacted soil barrier at the Worthington Construction/Demolition Landfill for Rumpke of Indiana, Inc.
- **Solid Waste Facility Quality Assurance.** West Union, Ohio. Project Manager responsible for the preparation of the construction quality control/quality assurance plan for daily cover at the Adams County Landfill near West Union, Ohio. The plan assisted the client, Rumpke Waste Removal Systems of Cincinnati, in avoiding the immediate closure of the facility by the Ohio

Environmental Protection Agency. The facility had an abundance of large clod size clay material being used as daily cover material. The plan outlined methods to reduce clod size by providing test plots and inspection activities to satisfy the regulating agency.

- **Solid Waste Facility Projects. Bloomington, Indiana.** Project Manager responsible for a number of activities at the Anderson Road Landfill on behalf of the Monroe County Solid Waste Management District. These include four soil borrow/reclamation plans, feasibility studies for leachate treatment, land use, equipment upgrading, synthetic daily cover material, attended meetings between Solid Waste District and the State Commissioner's office, prepared sedimentation basin bidding documents, prepared cost estimates for various activities at the landfill. Applications for land application of Wastewater Treatment Plant sludge as a soil amendment as final cover has been applied for.
- **Solid Waste Facility Permitting. Bloomington, Indiana.** Project Manager responsible for the preparation of the permit application for a 6.5-acre construction demolition waste landfill on behalf of the Monroe County Solid Waste Management District. This facility is located on the Anderson Road Landfill site. The permit application included, but was not limited to, initial facility layout, method of operations, specifications for the installation of the clay liner, final contour plan, drainage plan, erosion control plan, and information characterizing the waste being deposited in this facility. Application included supporting information on the hydrogeologic conditions of the site, closure and post-closure activities and construction cost estimate for the establishment of financial responsibility.
- **Incinerator Closure. Crane Naval Support Center, Crane, Indiana.** Project Manager responsible for the closure certification of a munitions incinerator removed by the Environmental Protection Branch of the Navy. Work included a site meeting, collection of testing and analytical data, hazardous waste manifest documentation, and assembling a document with the closure certification as required by the Indiana Department of Environmental Management.
- **Solid Waste Facility Design. Concord, North Carolina.** Responsible for design of 63- and 278-acre landfill for BFI, Inc., located on Charlotte Motor Speedway property. Responsible for final grades, erosion control (temporary and permanent), site drainage, acting as liaison between DNR and client, and redirecting off-site drainage in DOT right-of-way to minimize stormwater passing through the landfills.
- **Solid Waste Facility Reclamation. Monroe County, Indiana.** Project Engineer responsible for the design of the reclamation plan for a 30-acre landfill. This landfill was under Consent Decree issued by the State of Indiana, Department of Environmental Management.
- **Solid Waste Facility Closure/Post Closure Plan. Nappanee, Indiana.** Prepared a closure/post closure plan for El-Ko Landfill, a solid waste facility, under consent decree with the State of Indiana.
- **Solid Waste Facility Closure/Post Closure Plans.** Project Engineer responsible for the compiling closure/post-closure plans for four Rumpke of Indiana solid waste landfills. The facilities are Medora, Uniontown, Worthington, and Milan landfills, all located in east-central Indiana. The closure/post closure plans include information on performance standards, scheduling, material specifications, final contour plan, drainage and erosion control, material testing results, gas venting locations, closure and post closure cost estimates, and construction quality assurance documents.

- **Environmental Site Investigation. Marquette, Michigan.** Project Engineer responsible for soil and ground water investigation as a result of a leaking underground storage tank at a Board of Light and Power plant. Investigation and report included a feasibility study into three methods of remediating the site. The client chose to pursue a bio remediation clean up in an effort to possibly shorten the clean up time.
- **Environmental Site Investigation. Marquette, Michigan.** Project Engineer responsible for assembling a soil analysis and report for the Marquette Board of Light and Power regarding the apparently impacted soil on an access road to one of their facilities. Report included discussions on organic compound exposure limits and health hazards associated with exposure to humans. This report led to a second phase of soil analysis. All work was negotiated with the Marquette office of the MDNR. The second phase of this investigation was targeted at background concentrations and lingering levels of compounds in the access road.
- **Environmental Site Investigation and Remedial Activities. Allendale, Michigan.** Project Engineer responsible for the investigation into impacted soil and ground water resulting from two leaking underground storage tanks belonging to the Allendale Public Schools. Phase I roughly outlined the impacted area and Phase II defined the horizontal and vertical extent of the impacted area. The Phase II report discussed the options available for remediating the site. The most effective and cost-efficient method at this site was a purge system with discharge to the wastewater treatment plant. Work at this site included the removal of underground tanks with the school system using an alternative source for their fuel. All work was coordinated through the Michigan State Police/Fire Marshal Division and the Department of Natural Resources.
- **Commercial Subdivision Design. Charlotte, North Carolina.** Project Engineer for North Hills Commerce Center, a 63-acre site commercial subdivision. Responsibilities included the design of roadway, site drainage, stormwater detention, water and sanitary sewer service, and grading and erosion control plans. Unusual site features included three large diameter, high pressure gas lines that were influential in designing utilities. This site includes a Naval Reserve Center.
- **Commercial Subdivision Design. Mecklenburg County, North Carolina.** Project Engineer responsible for the design of plans and specifications for roadway, site drainage, water and sanitary sewer service for York Road Commerce Center, a 28-acre commercial park.
- **Military Site Development. U.S. Naval and Marine Reserve Center, Charlotte, North Carolina.** Project Engineer responsible for the design of plans and specifications for a 10-acre site. Project included grading, site drainage, stormwater detention, water and sanitary sewer service, and erosion control plan.
- **Industrial Site Development. Cabarrus County, North Carolina.** Project Manager responsible for the coordination and design of Phase I of this 25-acre site at Rowan-Cabarrus Community College. Work included grading, plan, site drainage, stormwater detention, erosion control, preparation of environmental assessment and Findings of No Significant Impact Statements for State of North Carolina review.
- **Wastewater Treatment Plant Sludge Study. Thomasville, North Carolina.** Project Engineer responsible for the preparation and recommendation for sludge disposal from a 5-mgd wastewater treatment plant. Recommendation was to construct and operate a composting system.